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AMPHIBIANS AND REPTILES FROM THE SUDAN

BY KARL P. SCHMIDT

CHIEF CURATOR, DEPARTMENT OF ZOOLOGY

A small series of reptiles and amphibians recently acquired by Field Museum of Natural History from Dr. Neal A. Weber, of the University of North Dakota, was collected by him in the Imatong Mountains near the Uganda border of the Anglo-Egyptian Sudan, in 1939, as a by-product of his entomological collecting. These specimens, though representing only seven species, afford a first glimpse of the herpetological fauna of this well-isolated range, whose upper slopes are covered by mountain rain-forest, while the high peak of Mount Kineti (10,458 feet) is a grassy "bald." The zoogeographic interest of the isolated mountain forests of East Africa is great, involving, as it does, consideration of geologic and climatic history and differential rates of speciation in plants and various groups of animals. Important contributions to the study of the reptilian and amphibian faunas of these forests isolated by open country have been made by Mr. Arthur Loveridge, who has outlined the problems in the summary report (1933) of his expedition to Tanganyika in 1929.

The collection includes specimens of the extremely wide-ranging toad *Bufo regularis* and of the equally widespread frog *Rana mascareniensis*. Two specimens represent the common spiny-footed skink *Mabuya varia*. These are essentially species of the African savanna, as is the single blind snake, *Typhlops punctatus*, and they offer no clue to any mountain endemism in the Imatong range. Much more interesting and significant is a single specimen of a small skink from the montane rain-forest, evidently a representative of the African group currently referred to *Siaphos*, but not identifiable with any of the African forms now known. There is also a new dwarf race of chamaeleon, of the *Chameleo bitaeniatus* series. This species is extensively represented by endemic races on the isolated mountain groups of East Africa.

LIST OF SPECIES

Bufo regularis regularis Reuss

Bufo regularis Reuss, Mus. Senck., 1, p. 60, 1834—Egypt.

Bufo regularis regularis Loveridge, Occ. Papers Bost. Soc. Nat. Hist., 8, p. 53, 1932.

A single specimen from Longoforok, east side of Imatong Mountains, altitude 1,367 feet. Collected beside cot in rest house; July 30, 1939.

Rana mascareniensis mascareniensis Duméril and Bibron

Rana mascareniensis Duméril and Bibron, Erp. Gén., 8, p. 350, 1841—Madagascar, Mauritius, and Seychelles.

Rana mascareniensis mascareniensis Loveridge, Bull. Mus. Comp. Zool., 72, p. 385, 1930.

A single specimen from the Lotti Forest, west side of Imatong Mountains, altitude 3,300 feet. Collected August 5, 1939.

Mabuya varia Peters

Euprepes (Euprepis) varius Peters, Monatsber. Akad. Wiss. Berlin, 1867, p. 20, 1867—Tette, Mozambique.

Mabuya varia Loveridge, Bull. U. S. Nat. Mus., 151, p. 74, 1929.

Two specimens from the top of Mount Kineti, 10,458 feet, collected July 27, 1939. I find no differences between these specimens and others from East Africa.

Leptosiphos subgen. nov.

Type.—*Lygosoma meleagris* Boulenger.

Diagnosis.—A group of small elongate skinks constituting a biological series with degenerative steps of evolution represented by various reductions in the size of the ear opening, the relative size of the limbs, and the number of digits; differing from the Australian *Siaphos equale* (the type of *Siaphos* Gray) in slenderness of body and tail, which are less muscular and less cylindrical, and in slenderness of digits, in which the subdigital lamellae are small and more numerous than the scales on the upper surface of the digit.

As here understood, *Leptosiphos* includes the thirteen forms listed in the following table. Boulenger (1909, p. 243) first called attention to the fact that the species then known formed a compact, related series.

SPECIES OF *Lygosoma* (*Leptosiaophos*)

Type locality

<i>aloytii-sabaudiae</i> Peracca	Mitiana and Toro, Uganda
<i>blochmanni</i> Tornier	Lake Kivu, Belgian Ruanda-Urundi
<i>burgeoni</i> Witte	Kalonge (6,800 feet), Mount Ruwenzori, Belgian Congo
<i>compressicauda</i> Witte	Sandoa, Katanga, Belgian Congo
<i>graueri</i> Sternfeld	Mount Karisimbi, Belgian Ruanda-Urundi
<i>helleri</i> Loveridge	Bugongo Ridge (9,500 feet), Mount Ruwen- zori, Belgian Congo
<i>kilimensis</i> Stejneger	Mount Kilimandjaro, Tanganyika Territory
<i>kutuensis</i> Lönnberg	Kutu (between Fort Hall and Embu Boma), Kenya Colony
<i>luberoensis</i> Witte	Lubero (west of Mount Ruwenzori), Belgian Congo
<i>meleagris</i> Boulenger	Mubuku Valley (7,000 feet), Mount Ruwen- zori, Uganda
<i>quattuordigitata</i> Sternfeld	Rugege Forest, Belgian Ruanda-Urundi
<i>thomasi</i> Tornier	Nairobi, Kenya Colony
<i>weberi</i> sp. nov.	Mount Kineti (3,300 feet), Imatong Moun- tains, Anglo-Egyptian Sudan

Siaphos,¹ to which these lizards have been referred in recent literature, may be applicable to a parallel series of forms in the Australian region that likewise exhibit a trend toward reduction of the limbs and finally of the digits. The type of *Siaphos* is the Australian *S. equale*.

Sternfeld, in describing *graueri*, divides his specimens into a five-fingered and a four-fingered series, naming them, with a fine disregard for the principles of nomenclature, *quinquedigitata* and *quattuordigitata*. These appear to be valid geographic forms; *quinquedigitata*, regarded as the typical subspecies, becomes *graueri graueri* (Loveridge, 1936, p. 72). Loveridge refers his new form *helleri* to subspecific status under *meleagris*. I have left all of the named forms as species, since a comprehensive study is required to clear up the taxonomy of the group. Sternfeld's reference of a four-fingered and a five-fingered form to the same species calls attention to an important matter in such degenerating series, namely, the increased variability and hence reduced significance of a character of such apparent importance as the presence or absence of a vestigial finger.

While some of the forms of *Leptosiaophos*, such as *meleagris* and *graueri*, are well known and are represented by considerable series in museum collections, a number are inadequately characterized,

¹ Originally spelled *Saiphos*, emended by the author (Gray, 1831, p. 72; 1845, p. 88).

and thus represent taxonomic hypotheses, subject to verification or disproof as further data become available. This is not especially a reproach, since it differs in no way from the widely approved method of research by means of a working hypothesis. The new form described below, while apparently well distinguished, is based on a single specimen and obviously requires additional specimens to establish its range of variation and its relations. Revision of the group will necessarily be long postponed.

The "building block" method of establishing genera by the brigading of demonstrably related species, instead of by the arbitrary partition of larger groups of species into smaller on the basis of characters thought to be of "generic" value, appears to represent a modern trend of great importance to systematic zoology. It is excellently illustrated by the inclusion in the genera *Storeria*, *Pituophis*, and *Salvadora* of Mexican species that lack the characters diagnostic of the majority of the species of these genera. This method merely involves an emphasis on inductive method as opposed to deductive.

Malcolm Smith has recently opened, or rather renewed, the discussion of the partition of the great series of species of skinks lumped under the generic heading "*Lygosoma*" in Boulenger's Catalogue of Lizards. It has long been taxonomic practice, followed essentially for reasons of convenience, to recognize the Boulengerian sections of *Lygosoma* as genera, following the example of Stejneger (in various papers, cf. 1899, 1907). The fact that generic names serve a double purpose, that of taxonomic convenience on one hand and of an index to phylogenetic relations on the other, does not seem to me especially disturbing or even inconsistent. The arrangement in groups for easier taxonomic review represents a primitive stage in the classification of most groups of animals, and the improvements in that classification, based on continuing zoological research, have been consistently in the direction of a more natural system. The whole course of systematic zoology, following the establishment of the Linnaean classification, in which, for example, salamanders and crocodiles were included in the genus *Lacerta*, illustrates this evolution of zoological classification.

The employment of the sections of *Lygosoma* (in the broad sense of older authors) as genera without continuing critical analysis and review, represents a primitive stage in our knowledge of the lizards so grouped. Malcolm Smith's review represents a competent zoological study, marking a real advance from the stage in which an

artificial systematic arrangement represents "taxonomic convenience," and directed toward a more natural classification that approximates the phylogeny of the group. Since much more study is required for the permanent clarification of this group, there is no grave reason against continuing the use of the sections of *Lygosoma* (as restricted by Smith) as generic, subgeneric, or sectional names, or even to multiplying them.

***Lygosoma* (*Leptosiaphos*) *weberi*¹ sp. nov.**

Type from Lotti Forest, west side of Imatong Mountains, Anglo-Egyptian Sudan. Altitude about 3,300 feet, in heavy rain-

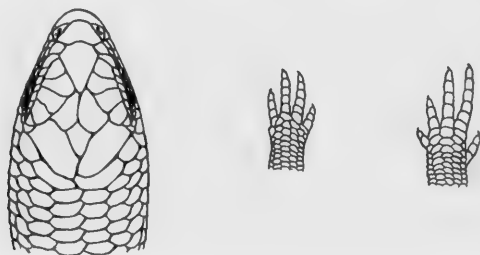


FIG. 27. Head and feet of *Lygosoma* (*Leptosiaphos*) *weberi*, type. $\times 4$.

forest. No. 34483 Field Museum of Natural History. A juvenile male. Collected August 5, 1939, by Neal A. Weber.

Diagnosis.—A species of the group of elongate dwarf skinks referred in this paper to the new section *Leptosiaphos*, with minute ear opening, with four fingers and five toes, and frontonasal entire. Distinguished from *S. graueri*, to which it is thus allied, by the less elongate body and by having fingers and toes longer, the digital scales 4-5-5-3 on the fingers and 3-6-5-3-2 on the toes.

Description of type.—Body and tail elongate, subcylindrical; adpressed limbs failing to meet by the length of the forearm; head little wider than body, limbs much reduced, fingers and toes short, 4-5. Scales around body 22, all smooth; dorsals in a longitudinal row 58; median subcaudal scales a little widened. Rostral followed by an undivided frontonasal, broadly in contact with the frontal; prefrontals very small, lateral; supraoculars 4; superciliaries 7; labials 6 above and 7 below; frontoparietals a little larger than the

¹ Named for the entomologist Neal A. Weber, Assistant Professor of Zoology at the University of North Dakota, to whose enterprise the small herpetological collection here reported is due.

occipital; a pair of elongate nuchals behind the parietals; temporals 2-2, the upper anterior the largest; one pair of chin shields in contact behind the postmental.

Scales on the upper sides of the digits large and much longer than the subdigital lamellae; these scales, counting from the inner fingers and toes outward, are respectively 4-5-5-3 on the fingers and 3-6-5-3-2 on the toes. The subdigital lamellae are 5-10-10-5 and 6-14-12-8-3.

General color brown above, paler beneath; obscurely lineate above and on the sides because of darker spots on the centers of the scales; the ventral scales unspotted, the ventral caudals pigmented; the upper labials each with a large brown spot, the lower labials with small spots.

Measurements.—Head and body 33; tail 42 (incomplete); arm 6.5; leg 8.

***Chameleo bitaeniatus kinetensis* subsp. nov.**

Type from Mount Kineti, Imatong Mountains, Anglo-Egyptian Sudan. Altitude 10,458 feet. No. 34484 Field Museum of Natural History. Adult female. Collected July 27, 1939, by Neal A. Weber.

Diagnosis.—Directly allied to *Chameleo bitaeniatus ellioti*, from which it is distinguished primarily by its smaller size and less uniform dorsal crest.

Description of type.—Body form like that of *Chameleo b. ellioti* but less elongate, the tail longer than the body. Head with low casque and forked occipital ridge. Scaling of body uniform except for an obscure dorso-lateral row of enlarged rounded tubercles; dorsal crest obscurely saw-like, the tubercles in groups of four or five increasing from a very small one to the largest, which is little more than 0.5 mm. in length; these groups more obscure on the tail; gular and ventral crests low.

Measurements.—Total length 115; tail 60; arm 27; leg 27.

Remarks.—The eggs number three in the left oviduct and five in the right and measure about 7 mm. in diameter. They are thus fewer in number and larger than in *ellioti*.

Chameleo bitaeniatus, on account of its wide distribution in East Africa, its wide range in altitude, and its partition into geographic forms, some of which are extremely well differentiated, is of more than ordinary interest, as may be seen from the accounts of the

species by Sternfeld (1912, 1912a) and Parker (1932). *C. bitaeniatus kinetensis* represents an independently evolved dwarf race. It is evidently derived from the lowland *C. b. ellioti* in the less favorable environment of the upper levels of Mount Kineti as *rudis* is from *graueri* on Mount Ruwenzori, and as *altaeeligonis* on Mount Elgon (Loveridge, 1935, p. 15) is from *hoehneli*.

It remains to be determined to what extent these dwarfed montane races are genetically fixed, and to what extent they exhibit variation gradients correlated with altitude.

Typhlops punctatus Leach

Acontias punctatus Leach, in Bowditch, Miss. Ashantee, p. 493, 1819—Fantee.

Typhlops punctatus Boulenger, Cat. Snakes Brit. Mus., 1, p. 42, 1893.

A single specimen typical of the lineolate Sudanese *punctatus*, from Lomariti, Imatong Mountains, collected August 4, 1939.

Atractaspis conradsi Sternfeld

Atractaspis conradsi Sternfeld, Sitzber. Ges. Naturf. Freunde, Berlin, p. 94, 1908—Ukerewe Island, Tanganyika Territory.

A single specimen from Issore, Imatong Mountains, collected August 3, 1939. This specimen has scale rows 23–23–19; ventrals 232; anal divided; caudals 26 (paired); upper labials 5; lower labials 7; oculars 1–1; temporals 1–2; total length 530, tail 39.

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